Anchor Environmental, L.L.C.
1423 Third Avenue, Suite 300
Seattle, WA 98101-2177
Phone 206.287.9130
Fax 206.287.9131

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000029-02

Dana Bayuk, RG
Oregon DEQ
2020 SW 4th Avenue, Suite 400
Portland, Oregon 97201-4987

Re: Addendum to Offshore Final Phase I Field Sampling Approach, NW Natural, Gasco Site, Portland, Oregon

Dear Mr. Bayuk:

This letter addendum was prepared by Anchor Environmental, LLC (Anchor) on behalf of NW Natural to address issues raised by Oregon Department of Environmental Quality (DEQ) during a November 20, 2006 meeting at DEQ. The purpose of the meeting was to discuss field procedures to be followed during continued Phase I offshore investigations scheduled to occur during the December 2006/January 2007 Willamette River work window. The discussions were based on the experience gained from drilling borings GS-9, GS-8, GS-7, GS-5, and GS-00 during October 2006. Phase I shoreline borings GS-1, 2, 3, 4, 6, 10, 11, and 12 remain to be completed.

This investigation is being conducted according to the *Final Phase I Field Sampling Approach Gasco Siltronic Groundwater Source Evaluation (FSA)* (Anchor, September, 2006). The FSA has been modified as agreed with DEQ by the following documents.

- *SOP for Discrete Depth Groundwater Sampling* (Anchor Memo to Matt McClincy, September 19, 2006)
- *Addendum to Offshore Final Phase I Sampling Approach, NW Natural, Gasco Site, Portland, Oregon* (Anchor letter to Dana Bayuk, September 29, 2006)
- *NWNG, Phase I Offshore FSA Telephone Discussions* (October 4, 2006, E-mail from Dana Bayuk to John Edwards)

In addition to the items raised by DEQ in the November 20 meeting, this addendum documents field procedures implemented with DEQ concurrence during the October 2006 investigation that will be used for the remainder of the Phase I offshore borings. The following items were discussed in the November 20, 2006 meeting:

- Protection of the Pilot Cap during the advancement of boring GP-06
- Notification of Coast Guard when working in the Cap area
- Addition of potable water to control heave
- Changes in sampling intervals from original work plan
- Additional samples based on field observations

Protection of the Pilot Cap during the advancement of boring GP-06

DEQ expressed concern that offshore drilling near the cap may impact the cap. These are the potential issues and how we plan to deal with them to prevent any impact to the cap:

- Propwash from the barge/tug: The cap is designed with a 1 foot thick quarry spall armor layer on the top that is designed to withstand 25-year return frequency velocities in the river. We have observed an ocean going vessel leaving the dock under full power with propellers directed toward the cap, and in subsequent observations found no noticeable change to the cap armor layer. The cap is more than adequately designed to deal with any propwash forces from the barge/tug. To the extent practicable, propwash associated with the barge movement will be directed away from the cap during maneuvering, but this may not always be possible.
- Grounding of barge on cap: We do not anticipate that the barge resting on the cap armor layer will have any impact on the cap since the weight will generally be spread out.
- Spudding of the barge on the cap: Although we do not think the spuds would be expected to penetrate the armor layer we will (1) attempt to orient the barge in such a manner as to avoid spudding on the cap and (2) if this is not possible, then the locations of the spuds on the cap will be recorded and we will place one cubic yard of similar armor stone in both locations after the drilling is complete.
- Drilling through the cap will not be allowed. The drill rig will be positioned so that the boring location is well shoreward of the upper limit of the cap.

Notification of Coast Guard when working in the Cap area

DEQ requested that the Coast Guard be notified of our work near the cap consistent with the proposed regulated navigation area (RNA). It should be noted that the proposed RNA has not yet been approved and instituted, so the Coast Guard could not yet legally limit any activity in this area. However, we did contact the Coast Guard and explain the purpose of the research and that it is consistent with the overall Superfund and DEQ programs at the requirement of DEQ. The Coast Guard is currently processing the application and will likely send approval of the request in the next week or so. During the call we asked if we need to maintain communication with them regarding any potential actions by NW Natural in the cap area. The Coast Guard replied that their only function is to post the area as being a RNA to notify vessel operators. The Coast Guard will only need to be notified if the RNA area needs to be revised or to remove the RNA some time in the future.

Addition of potable water to control heave

During the course of drilling in October, sand heave was encountered in the borings. During the October drilling Prosonic attempted to remove the heave material from the casing by coring. However, this was not successful because additional heave occurred when removing the core barrel. It was found that multiple coring runs to remove heave would result in multiple heave events at the same casing depth. Therefore, the addition of water has proven to be the most feasible means of controlling heave.

Working with DEQ and the drillers, a method was devised for adding water in a way to limit potential effects on soil and groundwater chemistry. Heave is typically an issue when advancing the 6-inch casing. Therefore, soil is cored ahead of the of the 6-inch casing and following removal of the soil core, the water sampler is advanced beyond the bottom of the previously cored interval to the next water sampling interval. The screen is then exposed by withdrawing the screen cover, the interval is purged, the water sample collected, and the sampler removed. Then, if necessary, potable water is added to control heave while advancing the 6-inch casing to the bottom of the previously cored interval.

Prior to obtaining groundwater samples, purge water is monitored until groundwater pH and conductance readings stabilize. This purge monitoring works to assure that representative groundwater is being obtained, unaffected by the addition of water to control heave.

Changes in sampling intervals from original work plan

The sampling interval described in the work plan calls for soil and groundwater to be collected from the same interval; however, due to the need to add water to control heave as described above, the intervals have been slightly adjusted. The soil sample interval has been raised to the interval immediately above the water sample. Soil samples, instead of being precisely co-located with the water sample, are collected from the bottom three feet of the previous coring run. The water sample is then obtained from approximately three feet deeper than the maximum depth previously cored. For example, for the 50-foot core sample, drill rods will be pushed to 48 feet, and the soil sample will be cored from 45 to 48 feet. Following removal of the core barrel, the water sampler is then pushed to the 50-foot sample interval. The sleeve around the screen is then withdrawn, exposing the screen to undisturbed soil from 48 to 52 feet. Using this method minimizes the potential for downhole cross contamination because the water sampling screen is not exposed until it has been pushed below the previous maximum core depth. As described in the previous section, the borehole is then purged prior to obtaining the groundwater sample.

Most of the planned borings are located near the foot of the river embankment, where we expect to encounter rip-rap of varying thickness before we reach soil or sediment at the base of the rip-rap. Sampling of soil and/or groundwater in the upper rip-rap zone will likely not be

feasible. For these locations, an attempt will be made to push the water sampler to the 5-foot water sample depth (4 to 6 feet interval). If the water sampler encounters refusal at this depth due to the presence of rip-rap, a water sample will not be taken and coring will continue down to 9 feet. The water sampler will then be advanced to the 10-foot water sample depth (9 to 11 feet interval). Should the water sampler encounter refusal at this depth, a water sample will not be taken and coring will continue to 23 feet. The water sampler will then be advanced to the 25-foot water sample depth (23 to 27 foot interval).

Additional samples based on field observations

While drilling boring GS-05 Anchor and DEQ field staff noted an unidentifiable odor coming from the borehole and samples. The odor was described by some as similar to "dirty gym socks". During the November 20 meeting DEQ requested if in the future, there are areas where unidentifiable odors or other field indications of contamination are observed in a zone outside of a planned sampling interval, additional soil and/or water samples be collected and analyzed for the full list of semi-volatile organic compound by EPA method 8270 with tentatively identified compounds (TICs). Following the meeting, Anchor contacted Columbia Analytical Services and requested analysis of the soil sample collected from 95 to 98 feet using method 8270 (TIC). The sample had been in laboratory cold storage, but was beyond the method hold time limit, so the results will be useful only as a general indicator of potential contamination.

Please don't hesitate to contact us if you have any questions or comments.

Respectfully Submitted,

John Renda, RG
Anchor Environmental, L.L.C.

John Edwards, RG, CEG
Anchor Environmental, L.L.C.

Cc: Bob Wyatt
Patty Dost
Carl Stivers
Rob Ede